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The origins of individual differences in competence: attachment history and environmental support.

Margaret H. Ricks
University of Massachusetts Amherst

THE ORIGINS OF INDIVIDUAL DIFFERENCES IN COMPETENCE: ATTACHMENT HISTORY AND ENVIRONMENTAL SUPPORT

A Dissertation Presented

By

MARGARET H. RICKS

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Approved as to style and content by:

Seymour Epstein, Ph.D., Chairman of Committee

Nancy A. Myers, Ph.D., Member

Richard Bogartz, Ph.D., Member

George Forman, Ph.D., Member

James M. Royer
Professor and Acting Chairperson
Department of Psychology

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Abstract

Origins of Individual Differences in Competence: Attachment History and Environmental Support

Margaret H. Ricks, B.A. Barnard College
M.A., University of Massachusetts,
Ph.D., University of Massachusetts
Directed by: Professor Seymour Epstein

The role of early experience in later functioning is a central question which cuts across all realms of developmental psychology. In the study of social development, the past twenty years have seen a surge of interest in the effect of early attachment relationships on later psychological competence. This body of work has important implications ranging from practical issues of parenting and child care to theories of adult personality and psychopathology. This study investigates the contributions of prior attachment history and concurrent environmental support to individual differences in the psychological competence of young children. A number of recent research reports have found that the Ainsworth Strange

Situation classification of the quality of the one-year-old's attachment to the mother is predictive of functioning through 5 years of age. None of these studies is without problems. Therefore, the first goal of this investigation was simply to replicate the finding of continuity from infant attachment classification to competence in the preschool years. Secondly, studies published to date imply that continuity resides within the child. However, since the attachment classification is, in theory and in fact, highly related to the attachment figure's sensitivity and responsivity to the infant over the course of the first year, it is reasonable to suppose that continuity of individual differences may be in part a function of continued maternal support. The second goal of the study was to investigate the relationship between concurrent maternal variables and the preschool child's psychological adjustment.

Forty-four preschool children and their mothers participated in the study. All children were seen at one year of age in the Ainsworth Strange Situation and the quality of their attachment to the mother classified according to Ainsworth's criteria.

Results provided substantial support for both continuity of individual differences in children, and continuity in the quality of environmental support for

children's competence. Securely attached infants were more curious, more affectively positive, and received higher scores on a measure of receptive vocabulary than children anxiously attached to the mother in infancy. Parallel differences between mothers were found, with secure group mothers being more affectively positive and supportive in interaction with their children than anxious group mothers.

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C H A P T E R I

HYPOTHESES

This study tests two central hypotheses. The first hypothesis is that individual differences in the quality of the infant's attachment to the mother at one year of age are predictive of individual differences in competence in early childhood. Self-esteem is associated with positive affect,(Epstein, 1973, 1980) and is thought to be a central dimension of adjustment in the preschool years (Sroufe, 1983, Harter, in press, Waters, Noyes and Ricks, Note 1, Epstein and Erskine, Note 2). An attempt was made to use convergent measures of these constructs as indices of child competence in the 4 to 5 year olds who serve as subjects in the study. Previous literature, reviewed below, suggested that the first hypothesis would be confirmed. This same literature, on continuity of early individual differences, tends to attribute the finding of continuity to the child. The second hypothesis of this study was that individual differences in <u>mothers</u> would be related to individual differences in their child's competence in the preschool years. That is, while later competence may be a function of early attachment

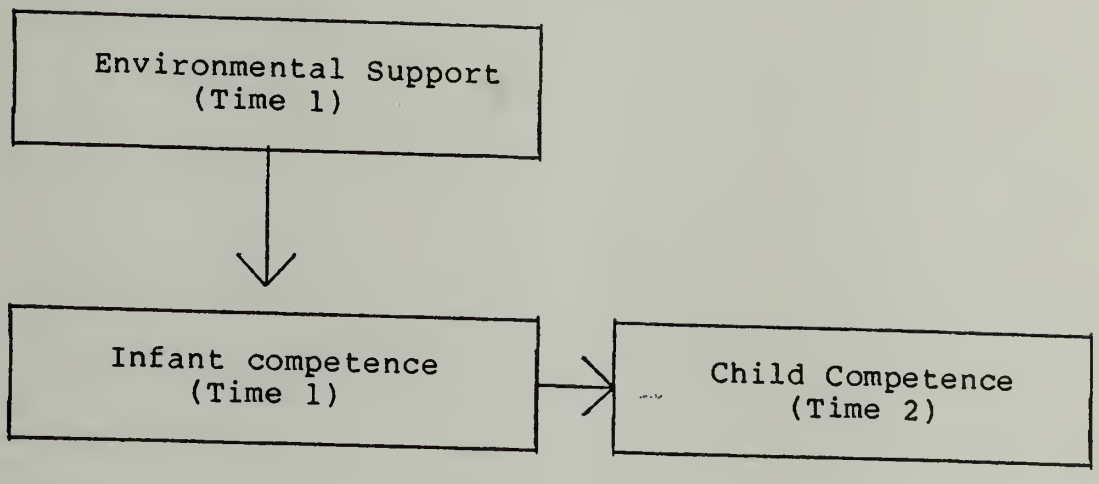
history, it may also be a function of continued environmental support. Figure 1 schematically shows the underlying model of previous research and the model of this study. The model is something of a simplification of previous theory, since Bowlby (1969, 1973, 1979, 1980) and Sroufe (Matas, Arend and Sroufe, 1978, Arend, Gove, and Sroufe, 1979) do suggest that environmental input affects the child's competence. However, they both view early attachment history as critical and tend to remark on the role of environmental support in later years only peripherally. It is, moreover, important to note that regardless of theoretical model, no empirical work addresses the model proposed.

Review of Literature

Continuity from attachment to later competence

This section reviews investigations of continuity of individual differences from quality of attachment to the mother at one year to later behavior. With one exception, only studies which used the Ainsworth Strange Situation (Ainsworth and Wittig, 1969) between 11 and 18 months and classified infants according to Ainsworth's criteria are included. These are the only extensively validated measures and the only age range for which it is appropriate (Ainsworth, Blehar, Waters and Wall, 1978).

A. Model of Previous Research



B. Model of Current Study

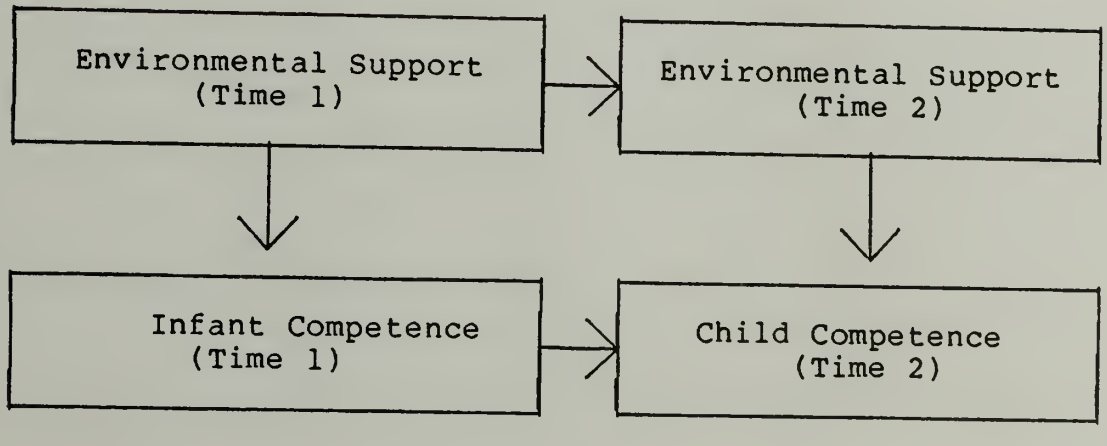


Figure 1. Implicit models of research on origin of individual differences.

(The exception is a study by Waters, Wippman and Sroufe (1979) which used a modified Strange Situation, but in which all infants were independently classified by two psychologists extensively trained in the use of Ainsworth's criteria for classification of infant attachment, Everett Waters and L. Alan Sroufe.) While the sum effect of the studies to be reviewed appears to be an impressive demonstration of continuity, there are only a handful of published studies and these are not without problems. The current study aims not only to assess continuity from attachment history to preschool competence, but also to investigate the role of continued maternal input to individual differences in children. In the following review, studies which have included measures of maternal behavior are given particular emphasis. It should be noted at the outset, though that even the few investigations which have included maternal variables conclude that continuity resides within the child. This is particularly striking when the Strange Situation classification of infant behavior at one year appears to predict later maternal behavior more strongly than it predicts later child behavior (e.g. Bell, described in Ainsworth, et al., and cited as "monograph in preparation," 1978).

This review is divided into two sections. The

first discusses research primarily concerned with child outcome. The second reviews research on later mother-child interaction.

Studies focussing on child outcome

Sroufe and his colleagues have contributed the major research effort designed to address the question of continuity of individual differences in attachment to later child behavior. The first published demonstration of such continuity was a study by Matas, Arend and Sroufe (1978) of 44 two-year-olds from stable, middle class families. The procedure included a free-play session in which the child's compliance with the mother's request that he pick up the toys was of primary interest, and a graded series of problem-solving tasks in which the child's persistence, enthusiasm, affect and flexibility in help-seeking were of interest. Problem solving tasks ranged from those any two-year-old could master with ease, to those too difficult for a two-year-old to accomplish without help. While both those children who had earlier been classified as anxiously attached to the mother and those earlier classified as securely attached to the mother initially showed negativism to the request to pick up the toys, those earlier seen as securely attached were more likely to comply than were those earlier seen as

anxiously attached. In the problem-solving tasks, children who had been classified as securely attached at one year were rated higher on persistence, enthusiasm and positive affect than were the children who had been classified as anxiously attached to the mother at one year of age. In addition, children seen as secure in relation to the mother at one year were rated as more effective in getting and using their mother's assistance in the more difficult tasks.

The primary concern of this study was tbe child's behavior rather than the mother's behavior. However, ratings of the 'quality of maternal support' were significantly higher for mothers whose infants had earlier been classified as secure, compared to mothers whose infants had earlier been classified as anxious in the attachment relationship. Thus, the first paper to show continuity of individual differences in child competence from attachment to later behavior also suggests continued environmental support for the child's competence. In subsequent research reports, Sroufe and his colleagues have reported only child variables.

Arend, Gove and Sroufe (1979) investigated the sample of children in the Matas et al. (1978) study when they were between 4 and 5 years of age. Using a variety of measures derived from the Blocks' (1980) assessments of

ego control and ego resilience, they found, as predicted, that children classified as secure in relation to the mother in infancy were more resilient and more moderate on measures of ego control (e.g. they tended to be neither over nor under controlled; neither restricted nor impulsive) than were children earlier classified as anxious in relation to the mother.

Waters, Wippman and Sroufe (1979) reported on a sample for whom only modified Strange Situations, including one separation from and reunion with the mother, rather than the standard two separations was available. They found three-and-one-half year olds thought to be securely attached to the mother at one year scored higher than those thought to have been anxiously attached to the mother at one year on a conceptually derived scale from the California Preschool Q-set (Bronson, Note 3) reflecting social competence.

Again focussing on child outcome related to one-year attachment classification, Sroufe (1983) conducted an intensive investigation of 40 children selected from a longitudinal sample of over 200 economically disadvantaged children. Two nursery school classes were established for the investigation; each met five days a week, one for 12 and the other for 16 weeks. The first included 16 children, the second 24. Measures reported to date

include teacher's ratings and Q-sorts, and extensive observations of the children's social and affective behavior. Compared to the children earlier classified as securely attached, those earlier classified as anxiously attached were more likely to show bizarre behavior and behavior problems, and were more dependent on teachers. In contrast, those earlier classified as secure in relation to the mother scored higher on measures of the following characteristics: ego resilience and self-esteem (found to be highly correlated), social competence, empathy and compliance with teacher requests. In addition, those earlier classified as secure were more likely to demonstrate positive affect and less likely to demonstrate negative affect than were those earlier classified as anxious. Sroufe's conclusion is that because these individual differences were seen in the child apart from the mother they exist independently. "Thus, while the quality of adaptation originally resided in the dyad, ultimately it was revealed in assessments of the child apart from the mother." (Sroufe, 1983, p. 6). However, no measures of maternal variables were used. The role of continued maternal input cannot be ruled out; individual differences exhibited later may not be solely a function of early infant-mother attachment.

In a related study of other children in the

larger pool from which Sroufe's (1983) classrooms were arranged, Pastor (in press) investigated the orientation to peers of children aged 20 to 23 months. He found that those classified as securely attached to the mother at 18 months were more sociable and more positively oriented toward peers.

In summary, studies focussing on child outcome related to earlier classification of infant-mother attachment show a consistent pattern of predictability from security in the early attachment relationship to competence at 2,3, 4 and 5 years of age. Measures of competence have been diverse in content and form; the general picture that emerges of the secure infant as a preschooler is one of enthusiasm, persistence, confidence and smooth relations with peers and adults.

Studies of mother-child interaction

Relationships between quality of attachment at one year and later mother-child interaction have been investigated in three samples (Bell, cited in Ainsworth, et al., 1978, Joffee, Note 4, Maslin and Bates, Note 5, Main, Note 6). The results are published for only one sample (Main, Tomasini and Tolan, 1979 and Londerville and Main, 1981).

Bell (cited in Ainsworth, et al., 1978) undertook an extensive longitudinal investigation of 33 black

infants from low income families, observing them in free play sessions with their mothers at 15, 18, 24, 30 and 36 months of age. Bell used fourteen measures, focussing on child and mother bids for interaction, response to other's bids, and the affective quality and type (physical vs. verbal) of bids and responses. Of particular importance to the proposed investigation is her finding that the proportion of maternal initiations classified as positive was significantly related to the infant's earlier Strange Situation behavior in each later observation. Furthermore, this measure -- a measure of maternal, not infant behavior -- was the only one of the fourteen measures used to be significantly correlated with the Strange Situation behavior at all later points in the investigation. Three measures were significantly related to earlier behavior in the Strange Situation at 24, 30 and 6 months, but not at 15 months: child's positive behavior to mother (physical, verbal or social), ratings of mother's warmth in interaction and ratings of the mother's level of communication with the child. Unfortunately, Bell's study is available only in summary form. Since the total of 14 variables are each correlated with Strange Situation variables (classification, positive behavior to mother, combined avoidance and resistance score) and taken on five occasions, the total number of possible correla-

tion, 210, is high; one cannot discern the total number of significant correlations from the summary in Ainsworth, et al. (1978).

Two unpublished studies of relationships between one-year attachment classification and later mother-child interaction both focus on maternal control and toddler compliance. Joffee (Note 4) investigated a sample of 117 mother-infant pairs at 12 and 18 months in the Ainsworth Strange Situation and a laboratory 'prohibition' situation designed to induce maternal control of her infant's exploration. He found that mothers of securely attached infants were more cooperative and less intrusive than mothers of anxiously attached infants. Securely attached infants were themselves more compliant than those classified as anxious. A recent research report suggests that later behavior at home is congruent with this laboratory observation. Maslin and Bates (Note 5) conducted home observations of 74 mother-toddler pairs when the children were 24 months, and related measures of conflict and harmony in interaction to the child's attachment classification at one year. Mothers of those earlier classified as anxiously attached were found to be more restrictive and their children were more likely to resist maternal attempts at control. Observers rated pairs that included an infant previously seen as secure in relation

to the mother as significantly higher on a scale of reciprocity in interaction.

Main, Tomasini and Tolan (1979) and Londerville and Main (1981) both report on a sample of 40 infants seen in the Strange Situation at one year and in a play session with mother and an unfamiliar adult at 21 months. Mothers of infants earlier seen as securely attached to them were more expressive, more accepting of their child, showed more positive affect and were more likely to describe their child as 'easy to live with.' Mothers of infants earlier seen as anxious more frequently displayed anger and their children were more likely to attack or threaten them. Children classified as secure in relation to the mother at one year were more cooperative with an unfamiliar adult, and were more likely to self-inhibit forbidden behavior than were children classified as anxious in relation to the mother at one year.

To summarize, the few studies that have investigated mother-child interaction as related to earlier infant attachment classification all report significant differences between pairs in which the infant had earlier been classified as anxious in relation to the mother. Mothers of children seen as anxious at one year appear to be more controlling in subsequent assessments; in complementary fashion, their toddlers appear to be less

compliant than toddlers earlier classified as secure in relation to the other. Not surprisingly, then, the interactions of pairs in which the infant was seen as anxiously attached to the mother at one year are rated as less harmonious than are the interactions of pairs in which the infant was seen as securely attached to the mother at one year.

In the present study, three convergent measures of preschool competence were used as outcome measures. One was a teacher description using a Q-sort self-esteem measure (cf. Block, 1961, Block and Block, Note 7, Waters, Noyes and Ricks, Note 1) and two were laboratory-based measures, namely, an emotions rating procedure (Epstein, Note 5) and the Pictorial Perceived Competence and Acceptance Scale for Young Children (Harter and Pike, Note 9). In order to compare continuity of individual differences in this sample with previous research, the Banta curiosity box assessment of curiosity was also used (Arend, Gove, and Sroufe, 1979, Henderson, Note 10).

A referential communication task was designed to challenge the communicative abilities of the mother-child dyad, and to provide an assessment of maternal behavior in interaction. Because this task stressed verbal communication, the Peabody Picture Vocabulary Test was also used to assess the role of the child's receptive vocabu-

lary in communicative interaction with the mother. To provide convergent assessment of maternal support for continuity, maternal personality and life history measures previously found to be highly related to infant attachment class (Ricks, Note 11, Note 12, Ricks and Noyes, Note 13, Tronick, Ricks, and Cohn, 1982) were used in addition to maternal behavioral support as observed in mother-child interaction.

C H A P T E R I I

METHOD

Subjects

Children

The sample consisted of white middle class children and their mothers, (evenly distributed among Hollingshead social classes I to IV, see Hollingshead, 1957) who had participated in an earlier study of individual differences in quality of attachment. Of the 63 infants who had completed the original study, 48 were located for the follow-up study reported. Four were unable to make laboratory visits. The sample for the follow-up study thus consisted of 44 children and their mothers. Included were 18 girls and 26 boys ranging in age from 48 to 68 months with a mean age of 58 months. Twenty-three children were first born, twenty-one later born. This sample of 44 subjects was representative of the original sample of 63 subjects who had been seen at one year with respect to mother's educational level and range of attachment classifications at one year.

Shortly after their first birthday, all children had been brought by their mothers to a university labora-

tory for assessment in Ainsworth's strange situation. Of the forty-four who provide complete data for the follow-up study, thirty had been classified as securely attached at one year of age (Ainsworth's category 'B'). Fourteen had been classified as anxiously attached. The anxiously attached group consisted of 10 classified as anxious-avoidant (Ainsworth's classification 'A') and 4 classified as anxious-resistant (Ainsworth's classification 'C'). All classifications were made by a Ph.D. psychologist trained by Sroufe's group, with no knowledge of any other measures in the original study. For correlational analyses, classification B3, (N=19), the modal group, was separated from classifications B1, B2, and B4 (N=11, Intermediate group). Although all B's are considered securely attached, this grouping reflects degrees of security and is common practice in correlational analyses using attachment classifications.

Mothers

Mothers ranged in age from 29 to 39 years. Mean age was 35 years. Their average level of education of 14 years ranged from 10 years (incomplete high school) to 20 years (3 years of post-graduate studies).

Procedures

Laboratory assesments

Overview. Forty-four children were brought by their mothers to a laboratory session lasting approximately 1-1/2 hours. Each child was administered a series of tasks in a large, brightly decorated playroom while the mother was interviewed in an adjacent, comfortably furnished reception room. All children were tested by the same female undergraduate student, Experimenter C, who was unaware of the one-year attachment classification. A second female undergraduate, Experimenter M, also unaware of earlier measures, interviewed the mother.

Emotion Ratings

Each child was rated at 3 different points during the laboratory visit on a 7 item emotions scale (Epstein, Note 8). Positive emotions rated were: 1. Calm, secure, emotionally stable, 2. Happy, joyous, enthusiastic, and, 3. Warm-hearted, affectionate, loving. Negative emotions rated were: 1. Sad, blue, unhappy, 2. Frightened, anxious, nervous, 3. Angry, mad, annoyed, and 4. Tense, on-edge, agitated. The rater was instructed to compare the child to the average child of the same age and sex. The 5 point scale used ranged from 1 (definitely less than average) to 5 (definitely more than average).

Experiments M and C made the first rating just after the child entered the play room. This rating of behavior during introduction to the laboratory reflected the child's behavior in the 10 to 15 minute period during which Experimenter M met the child and mother in the parking lot, brought them to the laboratory, and including a period in which Experimenter C encouraged the child to join her in playing with blocks and drawing material while Experimenter M explained procedures and obtained consent from mothers.

The second rating was made as the mother and child did the referential communication task. Experimenter C rated the child on the basis of observation through a one-way mirror during the procedure. Experimenters M and C made the third rating just after the mother and child left the laboratory.

Banta Curiosity Box

Experimenter C began by bringing the child into the playroom, uncovering the Banta curiosity box, and saying to the child, "You can do whatever you'd like with this; I have some work to do." She then sat at a low table and unobtrusively recorded the child's behavior. The curiosity box (Henderson, Note 7) is a large, brightly painted wooden box, with a variety of manipulable and tac-

tile objects on its surface (e.g., slinky toys and differing grades of sandpaper) and openings to its interior which contained more objects. After 10 minutes, the experimenter asked the child to stop playing with the Banta box and to join her in the next game.

Measures used to assess curiosity included: latency to touch the box from the time it was uncovered (elapsed time), number of objects manipulated, number of repeated manipulations, and total time engaged with the box.

Pictorial Scale of Perceived Competence and Acceptance for Young Children

The Perceived Competence and Acceptance Scale (Harter and Pike, Note 9) is designed to measure the child's perception of physical, and cognitive competence, and acceptance from mother and peers. The scale uses an interview format with pictorial answers, to which the child points, indicating which of the depicted children is most like him or herself. In a large scale study, Harter and Pike (Note 9) found that a two factor solution describing competence (including both physical and cognitive) and acceptance (from both mother and peers) best described the data. Thus, the scale should yield two scores; one for competence, one for acceptance.

Referential Communication Task

Mother and child jointly participated in a specially devised referential communication task. The task was revised from referential communication tasks in the literature (Dickson,1979, Dickson, Hess, Mikaye and Azuma, 1979) to elicit the motivation, and to tax the abilities of, mother-child pairs in order to provide a discriminative assessment of individual differences (cf. Waters and Sroufe, in press). Presented as a game, the task consisted of each participant placing furniture and figures in a dollhouse, with the goal of identical pieces being placed in identical rooms in each house. The child's dollhouse sat on a low table in the playroom and the mother's dollhouse on a table in the reception room. Each dollhouse had four rooms with different floor colors and wall colors and with wall decorations that indicated the room's function. For example, there were sinks and cabinets depicted on the kitchen walls, and toys and juvenile directions on the child's bedroom walls.

Mother and child communicated via battery-operated telephones. Split-screen videorecording, with one camera focused on the mother and one on the child provided complete records of each partner in the interaction. Microphones were placed on each table and jointly fed into the recording system.

The task included two episodes, one in which the child told the mother where to place the pieces (child 'sender,' mother 'receiver') and one in which the mother told the child where to place the pieces (mother 'sender,' child 'receiver'). In the first, Experimenter C gave the child a set of 5 objects to place in the house, with instructions that it was the child's turn to tell the mother what to do. Experimenter M gave the mother 5 objects identical to those presented the child, along with 15 objects with many of the same features. These extra objects were used as foils, to make it necessary for the 'receiver' to elicit a description of each object. For example, while the sender (episode 1) might choose to place 'a table,' the receiver had to have some information on whether it was a round yellow table, a tiny rectangular blue table, or a large rectangular brown table in order to match the piece.

In each 5 item set was included one "unidentifiable object." These items, designed to challenge the participant's communicative skills, looked as if they could belong in a dollhouse, but had no ready label. The first was a normal size (not miniature) beverage coaster, made of white plastic with a blue foam rubber mat on it. The second set included a black and orange plastic pen holder.

In episode 1, the sender (child) was presented with a small yellow kitchen-type chair, a low square brown table, a "twin" size green and white bed, and a 'girl' doll, dressed in blue, with yellow pigtails. The mother's objects included 5 objects that matched the child's and 3 'foils' for each of the child's 5 item set, varying in size, shape, color, and in the case of the girl doll, the sex and age represented.

Experimenter C gave the following instructions to the child:

> Now we're going to play a game with your mother. See this dollhouse? (Uncovers dollhouse) Your mother has one exactly like it out in her room. I'm going to give you some pieces to put in your dollhouse. Now, your mother has exactly the same pieces, but she has lots more pieces, too. The game is to get her to set up her house so it will look just like yours. You can put your pieces in the dollhouse wherever you want, then phone your mother to tell her what you did. Remember, the game is to make her house just like yours. Here's the telephone. (Explains use of phone. Repeats explanations if necessary).

Experimenter M explained the game to the mother in the same manner, adding that she could ask the child whatever she wanted. The instructions deliberately ignored suggesting to the participants that they include (or elicit) the name or characteristics of the objects, or a description of the room in which it had been placed.

An example set, with the child acting as sender,

was presented before beginning the task. Experimenter C gave the child a red metal toy car with a blue stripe on it, and asked the child to place it and instruct the mother accordingly. For the example set, the mother had a large plastic red car, a large plastic green and white car, a blue metal car, and one car matching the child's. Experimenter C stayed with the child during the example set, to insure that the child understood the game and knew how to use the telephone. She then brought the child into the reception room to look at the mother's placement of the object. Experimenters checked again to see that both participants understood tbe game. Then Experimenter C gave the child, the sender, set 1 (5 objects) and Experimenter M gave the mother, the receiver, set 1 (5 matching objects plus 15 foils), and each experimenter left to view the interaction through one-way mirrors. Both experimenters returned when the mother indicated that she and her child had completed the task. Experimenter C invited the child to see the mother's house, saying "Shall we go see where your mother put her pieces?" Mother and child were allowed as much time as they wanted to talk at this point. The mother was then encouraged to go to the playroom to view the child's house (no mother refused). The procedure for the mother as sender, child as receiver episode was enacted with roles reversed and was explained

as the mother's turn to tell the child where to put the pieces. In her 5-item sender set, the mother had a large red armchair, a round yellow table, a 'double' size green and white bed, an adult male doll dressed in green, and, as her "unidentifiable object," the aforementioned pen holder.

The referential communication task was scored for accuracy of placements (e.g., same piece in same room), for number of referents used and for four measures of maternal support during interaction: frequency counts of under-or over-control, of instances of blaming the child for failures, a rating of pleasure in interaction, and a rating of maternal supportive presence. Table 1 gives definitions and gives examples of each maternal behavior coded. Rating scales used 5 points, from definitely less than average to definitely more than average. To enable the coder to assign ratings, he reviewed all tapes before coding maternal behavior.

Peabody Picture Vocabulary Test

After the referential communication task, the child returned to the playroom with Experimenter C for administration of the Peabody Vocabulary Test (PPVT). The Peabody Picture Vocabulary Test is a measure of receptive vocabulary, in which the child indicates knowledge of a

TABLE 1

MATERNAL BEHAVIOR CODED

Behavior	Definition	Examples
1. Undercontrol	Hesitates to organize child's behavior when child appears to be unable to continue, or withdraws from interaction when child is floundering.	1. C[1]: (picks up phone, then silent) M: After 12 second silence says "What, Felicity?" 2. C: Do you have a bed too? M:"Umm" after 10 second silence hangs up.
2. Overcontrol	Interrupts or overrides child's initiative when child appears to be progressing smoothly.	1. M tells child where to place pieces when it's child's turn to tell her. 2. (Interrupting child): "Now, stop, let's count the pieces."
3. Blames child	Clear verbal expression implying that child is responsible for failure, regardless of tone.	1. M (on seeing child's house): "I didn't tell you to put that there." 2. M says "You gave me the wrong instructions".

Notes: 1. C - Child
M - Mother

word by pointing to its pictorial representation. Scores on the PPVT are highly correlated with IQ assessed on the Binet and Wechsler scales. They are generally found to be more highly correlated with verbal than with performance scales (Dunn, 1965). Experimenter C also rated the child on a three point measure of cooperativeness on completion of the PPVT.

Mother Interview

Once the child had entered the playroom for testing with Experimenter C, the second Experimenter, M, began the mother's interview. Three initial questions were designed to jog the mother's memory for events that occurred in the family since the child's visit to the laboratory at one year. Questions were on who lived in the household when the child reached his or her first birthday and on details concerning departures and arrivals of family members.

Life Stress Inventory. Experimenter M then gave the mother a copy of the Cochrane-Robertson Life Stress Inventory (Cochrane and Robertson, 1973) She instructed the mother to check each item which had occurred since her child's first birthday, and to put a line through each item that had not occurred. Sample items include unemployment, serious illness and birth of a new family

member. Mothers were instructed to indicate the person to whom the event had occurred, and to rate its ultimate impact on the family as positive, neutral, mixed or negative.

Family of Origin and Current Adjustment.

The remainder of the interview concerned the mother's family of origin and current relationships. These questions were intended, for present purposes, to clarify results from the Mother-Father-Peer Inventory, described below. Since the inventory concerns childhood relationships within the family of origin, it was important to know the extent of contact with mother and father, whether the mother had been separated from her own family of origin, and whether she had had experienced disruption. Questions concerned her parent's marital status, her experience of separation and loss, and her current relationships within her family of origin.

Take-Home Questionnaire

Two questionnaires were given to each mother on completion of the interview - the O'Brien-Epstein Sources of Self-Esteem Inventory (SOSE) (O'Brien, Note 14), and the Mother-Father-Peer Scale (Epstein, Note 15). Both employ Likert-type scales. The Self-Report Inventory is a measure of general self-esteem (the degree to which a per-

son reports that he likes himself and feels he is a person of worth versus having a low self-opinion), and of eight evaluative realms of the self-concept, including self-control, power over others, likeability/love-worthiness, competence, morality, body image, body appearance and body functioning. A defensiveness scale measures the extent to which respondents are likely to bias their answers toward gaining social approval.

The Mother-Father-Peer scale (Epstein, Note 15) includes the dimensions of acceptance-rejection (by mother, father and peers) and encouragement of independence-overprotection (by mother and father). It also includes measures of idealization of mother and father.

Teacher assessments

Parents of each of the 39 children enrolled in preschool or kindergarten programs were asked to identify the child's primary teacher and a second teacher if she or he knew the child well. Teachers were then asked to describe the child using the California Child Q-set (Block and Block, Note 7, 1983) and the Emotions Rating used in the laboratory. For the Q-sort each teacher arranged 100 CCQ items describing the child's behavior and psychological characteristics into a forced, quasi-normal

distribution according to the salience of each item with respect to that particular child. Teachers were neither aware of the study's hypotheses, nor of any prior or concurrent assesments. These personality and behavioral descriptions were then compared to a criterion definition of self-esteem to generate an index of self-esteem for each child. Composite Q-sort definitions of self-esteem had been derived from Q-sort definitions provided by 17 trained psychologists (graduate students and Ph.D. psychologists) as described by Waters, Noyes, and Ricks (Note 1). The comparison of the actual Q-sort description of each child with the composite Q-sort description yields a Pearson correlation coefficient. These correlations index the similarity between the teacher's description of the child and the criterion definition and serve as a self-esteem score. For example, a high positive correlation between the teacher's description of the child and the self-esteem criterion is interpreted as meaning that the child has high self-esteem. Conversely, a high negative correlation is taken to be indicative of low self-esteem.

C H A P T E R I I I

RESULTS

Overview of analyses

Preliminary analyses checked for sex and age differences on child measures using t-tests (two-tailed) and Pearson correlations, respectively. A second round of preliminary analyses checked for differences between the two groups of anxiously attached infants (anxious-avoidant and anxious-resistant) using Mann-Whitney U-tests. On continuously distributed dependent measures that showed no sex or age related differences, one-way analyses of variance with planned orthogonal contrasts (Anxious vs. Secure, Anxious vs. mean of Secure and Intermediate) were conducted. When violations of assumptions underlying analysis of variance were detected, non parametric tests were used. Categorical measures were analyzed using one-tailed tests of proportions. Preliminary analyses indicated that there were no sex differences or differences in age at follow-up associated with prior attachment class. Of the major child outcome measures, significant sex and age related differences occurred only on the Pictorial Perceived Competence Scale for Young Children (Harter and

Pike, Note 8). This measure was also the only one to yield differences between infants earlier classified anxious-avoidant and those earlier classified anxious-resistant. Cooperativeness rating on the Peabody Picture Vocabulary Test was significantly correlated with age ($r = .30$, $p < .05$).

There were also a few conceptually minor or statistically marginal sex or age related differences. The Emotions Ratings, when collapsed across the three rating points in time into a single bipolar rating, yielded no significant sex differences. However, item analysis showed marginally significant tendencies for boys to be rated as more "sad, blue, unhappy," and girls as more "warm-hearted, affectionate, loving" on introduction to the laboratory ($p < .09$ for each). Age was correlated with the rating "frightened, anxious, nervous" made during the referential communication task ($r = .34$, $p < .05$). There was also a marginally significant tendency for girls to be more successful than boys in the second (mother sender) episode of the referential communication task ($t = 1.81$, two-tailed $p < .08$).

Emotions Ratings

Inter-rater reliability and internal consistency

Table 2 shows the means and standard deviations

TABLE 2

MEANS AND STANDARD DEVIATIONS FOR DEPENDENT VARIABLES

Measures	Sample		Anxious Group (N = 14)		Intermediate Group (N = 11)		Secure Group (N = 19)	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1. Emotions rating	+2.75	10.17	+.68	12.63	+1.36	8.92	+5.08	8.8
2. Banta elapsed time[a]	15.56	28.2	20.5	36.9	19.9	37.3	9.1	5.2
3. Banta number of[a] objects manipulated	7.33	3.64	5.78	3.47	7.90	3.93	8.16	3.4
4. Banta number of repeated manipulations	4.34	2.84	3.57	2.37	4.9	3.66	4.6	2.7
5. Banta total time	514.8	130.1	508.1	149.8	494.7	177.3	530.8	82.25
6. Peabody Picture[a] Vocabulary score	119.8	15.92	110.8	19.5	122.1	14.7	125.	10.7
7. Referential communication--No. successes, child sender	3.26	1.53	3.00	1.65	3.54	1.69	3.26	1.41
8. No. successes, mother[a] sender	4.00	1.29	3.38	1.61	4.27	.78	4.26	1.19

TABLE 2 (Continued)

Measures	Sample $\bar{X}$	Sample SD	Anxious Group (N = 14) $\bar{X}$	Anxious Group SD	Intermediate Group (N = 11) $\bar{X}$	Intermediate Group SD	Secure Group (N = 19) $\bar{X}$	Secure Group SD
9. Time, child sender (seconds)	230	142	227	102	207	112	246	181
10. Time, mother sender	187.	82	198	95	196	27	174	15
11. Maternal support[a]	3.48	1.19	3.0	1.17	3.45	1.36	3.84	1.01
12. Maternal pleasure in[a] interaction	3.27	1	2.86	.94	3.18	.75	3.63	1.2
13. % Blame child[a]	27		43		18		21	
14. % Over or under[b] control	45		64		63		21	

[a] Anxious vs. Intermediate plus Secure comparison significant.

[b] Anxious vs. Secure comparison significant.

for all dependent measures in the study. Inter-rater reliability between the two experimenters, defined as percentage of agreements within one scale point, averaged .86 over the 7 introductory ratings (range from .73 for Item 1. 'Calm, secure, emotionally stable' to .93 for Item 3. 'Warm-hearted, affectionate, loving'), and averaged .87 for the 7 general ratings (range from .74 for Item 5. 'Frightened, anxious, nervous to .95 for both Item 6. 'Angry, mad, annoyed and Item 7. 'Tense, on-edge, agitated'). In both the introductory and general ratings, only about 2% of decisions were more than two points apart (2.1% of introductory ratings, 1.8% of general ratings). The two experimenters conferenced immediately after mother and child left the laboratory. When ratings were 2 or more points apart they reached a consensus rating, which served as the child's score.

Inter-rater reliability for the referential communication emotion rating was determined by having an independent coder with no knowledge of any other procedure in the study, rate the videotaped interactions. Decisions within one scale point were, again, counted as agreements. Inter-rater reliability for the 7 different emotions ranged from .79 for Item 7. 'Tense, on edge, agitated to .91 for Item 1. 'Calm, secure, emotionally stable. Average reliability was .85. The two raters dif-

TABLE 3

INTERNAL CONSISTENCY OF EMOTIONS SCALE OVER THREE RATINGS PERIODS IN LABORATORY VISIT

	Introductory Period	Referential Communication Period	General Period
	Item - Total Correlations[a]		
Positive			
1. Calm, secure, emotionally stable	.70	.68	.76
2. Happy, joyous, enthusiastic	.75	.77	.81
3. Warm-hearted, affectionate, loving	.65	.65	.64
			alpha = .92
Negative			
1. Sad, blue, unhappy	.63	.72	.69
2. Frightened, anxious, nervous	.62	.57	.79
3. Angry, mad, annoyed	.85	.76	.78
4. Tense, on-edge, agitated	.71	.71	.79
			alpha = .94

[a] Item - total correlations were computed with the particular item deleted from the total, so that correlations would not be inflated.

fered by more than two scale points on less than 2% of decisions made.

When the three ratings of positive emotions were collapsed over the three points in time (introductory, referential communication, general), the total positive emotion scale yielded an alpha of .92. A parallel procedure for the four negative emotions yielded an alpha of .94. The high item-total correlations shown in Table 3 suggest, as expected, that for examining individual differences, these emotions can be combined into overall scales of positive and negative affect. Appendix A contains the inter-item correlations of these ratings.

Relationship to attachment class.

A composite emotions rating was derived for each child by subtracting the sum of all negative emotions ratings from the sum of all positive ratings. Children who had secure attachments in infancy were more likely than children who had anxious attachments in infancy to fall above tha median on the composite emotions rating (χ^2, 2, = 4.21, $p < .05$). Appendix B describes individual emotions analyses.

Banta Curiosity Box.

Children who had secure attachments to the mother

in infancy manipulated significantly more objects t = 1.91, one-tailed, $p < .05$). Number of repeated manipulations approached significance ($t = -1.26$, $p < .10$), with children previously judged secure higher than children previously judged anxious in relation to the mother. Children who had anxious attachments to the mother in infancy waited longer before touching the box than did children who had secure or intermediate attachments to the mother in infancy ($U = 120.5$, $W = 334.5$, $Z = 1.73$, p, one-tailed $< .05$). There were no differences related to quality of attachment in total time spent exploring the box.

Pictorial Perceived Competence and Acceptance Scale

Preliminary analyses indicated that scores on the Perceived Competence and Acceptance Scale were related to sex and age. Therefore, a repeated measures multivariate analysis of variance by sex (2) and attachment class (3) with age as a covariate was used to analyze results on this measure. Results indicated significant main effects of both age (Beta = .39, $p < .05$) and sex ($t = 3.04$, $p < .01$) on perceived competence scores, but no significant effects of sex, age or attachment class on perceived acceptance scores. On neither measure were there significant main effects or interactions with one-year attachment

class. Experimenter C had the strong impression that children often picked the 'best' answer, responding defensively rather than truthfully. This suggestion that children might defensively inflate their scores was corroborated by a significant negative correlation between childrens' report of perceived mother acceptance and actual ratings of mothers' behavior (support and pleasure combined) ($r = -.35$, $n = 44$, $p < .02$).

Peabody Picture Vocabulary Test

Children who had secure attachments to the mother in infancy received higher scores on the Peabody Picture Vocabulary Test than did children who had anxious attachments to the mother in infancy ($t = 2.61$, p, two-tailed $< .05$). Children who had had secure attachments in infancy were also rated as more cooperative in testing ($t = 2.35$, one-tailed $p < .05$), but cooperativeness, as indicated above, was significantly correlated with age ($r = .30$, $n = 44$, $p < .05$). The correlation of attachment class with cooperativeness rating, with age partialed out, was only marginally significant, ($r = .24$, $n = 44$, $p < .06$).

Teacher assessments

Teacher assessments were completed for 26 of the 44 children. Preliminary analysis indicated that teacher assessments were unevenly drawn from the sample as a

whole. Three of the five children not enrolled in preschool or kindergarten programs had been classified as anxiously attached at one year of age. Of the 7 children whose teachers refused or failed to return assessments, 5 had been classified as anxiously attached at one year. Both children whose parents refused permission for teacher assessments had been classified as securely attached at one year.

Inter-rater reliabilities between teachers, when two teachers provided assessments, were adequate to high for both Q-sort (mean correlation between two teachers' sorts = .671; with one exception all were above .60; range = .36 to .78) and emotions ratings (range = 83% to 100% agreement, mean = 95%).

Table 4 shows the results of teachers' assessments. Teachers tended to rate children classified as anxious in relation to the mother at one year more positively than children seen as secure in relation to the mother at one year. Thus, these data appear to be at odds with the picture that emerges from laboratory assessment. However, examination of the correlations between teacher ratings and Q-sorts and the laboratory assessments showed reasonable agreement.

The discrepancies between the teacher and laboratory based assessments thus appear to be due largely to

TABLE 4

TEACHERS' ASSESSMENTS RELATED TO CHILDRENS' ATTACHMENT CLASSIFICATION AT ONE YEAR

Teacher Assessments	Attachment Class					
	Anxious (N = 6)		Intermediate (N = 8)		Secure (N = 12)	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Emotions ratings						
1. Calm, secure, emotionally stable *a	4.0	1.09	3.13	.64	3.42	1.08
2. Happy, joyous, enthusiastic *a	4.17	.98	3.00	.53	3.58	1.3
3. Warm-hearted, affectionate, loving **a	4.17	.75	3.13	.64	3.42	.90
4. Sad, blue, unhappy	1.67	1.03	2.37	1.06	2.25	1.29
5. Frightened, anxious, nervous	2.00	1.09	2.37	1.19	2.58	.90
6. Angry, mad, annoyed	1.67	.82	1.87	.83	2.25	1.22
7. Tense, on-edge, agitated	1.83	1.33	1.75	.71	1.92	.99
Q-sort measure						
Self-esteem (z-score)	.47	.15	.50	.43	.54	.30

[a] Anxious vs. Secure plus Intermediate contrast significant.

[b] Anxious vs. Secure contrast significant.

* $p < .10$
** $p < .05$
*** $p < .01$

selective attrition. (For children in the lowest quartile, teacher assessments were available for only one out of the 5 who had been classified anxiously attached, but were available for 5 of the 6 who had been classified either intermediate or secure. Table 5 shows attrition on teacher assessments by attachment class and emotions rating.) Teachers' ratings thus overrepresented cases of discontinuity, that is, of severely attached infants who were not doing well in the preschool years, and anxiously attached infants who were doing well in the preschool years.

Correlations between laboratory outcome measures and teachers' assessments were computed. The general pattern of the results suggested that teachers' assessments were an accurate reflection of children's adjustment. Teachers' emotions ratings correlated significantly with laboratory initial ratings on all but one rating, "sad, blue, unhappy," The rest of the correlations ranged from .26 (tense, $r = .26$, $N = 26$, $p < .10$) to .45 (warm-hearted, $N = 26$, $p < .01$). Except for the rating 'frightened,' on which laboratory ratings at all three points in time were significantly correlated with teachers' 'frightened' ratings (r, initial .43, referential communication = .35, general = .36, all p's < .05), second and third ratings in the laboratory were not signi-

TABLE 5

ATTRITION ON TEACHER ASSESSMENT BY ATTACHMENT CLASS AND EMOTIONS RATING

Attachment Class at One Year	Emotions Rating			
	Quartile 1 (Low)	Quartile 2	Quartile 3	Quartile 4 (High)
Anxious	1/5	2/4	2/2	1/3
Intermediate	3/4	2/3	2/3	1/1
Secure	2/2	2/4	3/6	5/7

Note: Numerator indicates number of teacher assessments available in cell; denominator indicates total number of children in cell.

ficantly correlated with teachers' ratings.

Self-esteem, as measured by the teachers' Q-sorts, was positively correlated with ratings of maternal behavior (a composite of support and pleasure in the referential communication task) ($r = .43$, $p < .01$). The Q-sort criterion measure of self-esteem was marginally correlated with the introductory ratings calm ($r = .30$, $p < .10$), frightened ($r = -.25$, $p < .10$) and tense ($r = -.30$, $p < .10$). Self-esteem was marginally related to the number of objects manipulated on the Banta box ($r = .28$, $p < .10$), but was not significantly related to any other measures of child outcome.

Summary

Children who, as infants, had secure attachments to the mother were more curious, showed more positive affect, and received higber scores on the Peabody Picture Vocabulary Test than did children classified as anxiously attached to the mother in infancy. These results provide a replication of previous work, and indicate that there is a measurable degree of continuity in individual differences in competence from infancy to the preschool years.

The finding that curiosity in preschoolers assessed with the Banta Box situation is related to quality of attachment at one year replicates the results

of Arend, Gove and Sroufe (1979). While teacher assessments in the current study failed to replicate Arend et al.'s (1979) results showing that infants securely attached to the mother had higher self-esteem as preschoolers than did infants anxiously attached to the mother, selective attrition seriously attenuated the validity of the comparable results in the current study. The demonstration of continuity in the current study represent a foundation upon which examination of the sources of support for continuity may be based.

Maternal Support as Related to Individual Differences in Children's Competence

Preliminary analyses indicated that neither the mother's age nor the family's socioeconomic status was significantly correlated with any of the measures of maternal behavior. There were also no differences in maternal behavior associated with age or sex of the child. Nor were there any significant differences in the behavior of mothers of infants earlier classified as anxious-avoidant and those earlier classified as anxious-resistant. Therefore, measures were combined for analyses across the two anxious groups.

Because mothers of infants classified as intermediate in attachment (B1, B2, B4) have been shown to fall in between mothers of those in the modal attachment group

(B3) and those in the anxious groups (A and C) on a variety of measures of sensitivity and responsivity in the first year, comparisons were initially made between three groups: (Anxious (A,C), Intermediate (B1, B2, B4) and Secure (B3).

Referential communication task

Inter-rater reliability. Experimenter M used a checklist scoring sheet to tally successes (mother and child placing matching items in matching rooms) and to tally number of referents used. An independent scorer's check of 5 videotaped interactions indicated 100% agreement on these measures. Maternal behavior in the referential communications task was coded from the videotaped interactions, by a coder blind to all other procedures in the follow-up study, and unaware of attachment classifications. To assess inter-rater reliability, a second coder scored from ten videotaped interactions. Inter-rater reliabilities for the maternal pleasure and support scales, with ratings within one point counted as agreements, were 90% agreement for pleasure and 80% for support. Reliabilities for the frequency measures, instances of under and over control, and 80% for exact frequency. Inter-rater reliability for the categorical decision "blames child" was 100%.

In the referential communication task, both measures of success of the dyad and measures of maternal behavior in interaction with her child supported the prediction that mothers of securely vs. anxiously attached infants would themselves differ when their children were preschoolers. Three children, two earlier classified as anxiously attached, one a securely attached infant who had developed hearing problems by the age of 5, refused to initiate the referential communication task, but two subsequently participated when the mother was the sender. Table 2 shows the mean number of objects placed correctly (e.g in matching rooms). There were no significant differences related to attachment class in the time taken to complete either portion of the task. Nor were there any significant differences related to attachment class in number of referents used. The mean number of referents used by children (child sender) was 2.1 (SD = 1.14). The mean number of referents used by mothers was 2.9 (SD = .53).

There were no significant differences in task success related to attachment class when the child was the sender. In the second, mother sender, episode, pairs in which the child had had a secure attachment to the mother in infancy were more succesful than pairs in which the child had had an anxious attachment to the mother

($t = 2.09$, one-tailed $p < .05$).

Mothers of infants earler seen as secure in relation to them (modal and intermediate groups) were rated significantly higher on both pleasure in interaction ($t = 1.66$ one-tailed $p = .05$) and quality of support ($t = 1.7$, one-tailed $p < .05$) than were mothers of children who had had anxious attachments to them. Mothers in the secure groups were also significantly less likely to blame their children for failures in the referential communication task (χ^2, 1 d.f. = 5.13, $p < .05$).

Mothers of infants seen as modally attached (B group) were less likely to inappropriatedly adjust their interventions through undercontrol or overcontrol (χ^2, 2 d.f. = 8.03, $p < .05$ than were mothers in the anxious or intermediate groups.

Maternal personality and life history

Life Stress Scale. Total number of life stresses was not significantly correlated with any child or mother outcomes. However, a Perceived Negative Life Stress scale, derived by combining the number of stresses mothers rated as mixed (good for some, bad for others in the family, or having both good and bad impact on the family) and those rated as negative, was weakly but significantly correlated with the child's overall emotions rating (r =

-.29, $p < .05$). The measure of perceived negative life stress was not related to attachment class at one year, and was only marginally correlated with measures of maternal behavior. For example, the correlation of perceived negative life stress with maternal support was -.26 ($n = 44$, $p < .10$).

Self-esteem and childhood relationships

Seven of the mothers failed to return the two questionnaire measures. Of these, five were mothers of children classified as securely attached in infancy, and two were mothers of infants who had been classified as anxiously attched in infancy. Non-returned questionnaires were evenly distributed by child outcome on the emotions rating. Thus, attrition on these questionnaires did not appear to be selective in relation to either major predictor or major outcome variables. Mothers of infants earlier classified as anxious received higher scores on defensiveness on the self-esteem scale (O'Brien, Note 13) than did mothers of infants seen as intermediate in attachment, while mothers of infants seen as secure received the lowest defensiveness scores. Means for each of the three groups were significantly different. Reported in standardized z scores, these means were .63 for the anxious group ($SD = .80$), .29 for the intermediate group ($SD = .97$), and

-.7 for the secure group (SD = .72). Mothers of infants classified in the modally secure group were least defensive, and were significantly less defensive than mothers of infants in the intermediate group ($t = 2.76$, $p < .05$). Mothers of infants seen as anxious in relation to them in infancy were significantly more defensive than the two secure groups combined ($t = 2.83$, $p = .01$). Mothers in the anxious group had significantly higher idealization scores for both mother ($t = 2.7$, $p = .01$) and father ($t = 2.95$, $p < .01$) than mothers of children who had secure attachments to them in infancy.

In addition to being a personality variable of interest in itself, defensiveness can act as a suppressor variable, modifying the 'true' relationship between the self-report measure and other variables. Table 6 shows results of both approaches. Defensiveness on the self-esteem inventory, and idealization of mother and father on the Mother-Father-Peer Scale were significantly correlated with the child's attachment class at one year of age. When defensiveness or idealization was viewed as a potential suppressor, and controlled for in correlations between maternal self-report scores and child outcome variables, a number of significant relationships emerged. The partial correlations indicated that defensiveness (concerning the self) and idealization (of mother or

TABLE 6

CHILD OUTCOMES RELATED TO MOTHER'S SELF-ESTEEM AND RECOLLECTION OF CHILDHOOD RELATIONSHIPS[a]

	Child Outcome			
	Attachment Class (One Year)		Emotions Rating (4 to 5 Years)	
	Zero-Order	Partial	Zero-Order	Partial
Maternal Self-Esteem Scales[b]				
1. General self-esteem	.16	.37**	.19	.23*
2. Competence	.17	.30**	.15	.18
3. Lovability	-.03	.11	.33*	.37**
4. Likability	.06	.33**	0	.05
5. Self-control	.21	.33**	.21	.23*
6. Power over others	.10	.19	.07	.08
7. Morality	.18	.32**	.26	.29**
8. Body appearance	.09	.18	0	0
9. Body functioning	.24*	.34**	.05	.06
10. Identity	.19	.27*	.38**	.40***
11. Defensiveness	-.58***		-.15	
Recollection of Childhood Relationships				
1. Mother[c]				
Encouragement of independence	-.08	.03	-.04	0
Overprotection	-.07	-.16	-.18	-.21
Sum Score	0	.11	.05	.09

TABLE 6 (Continued)

	Child Outcome			
	Attachment Class (One Year)		Emotions Rating (4 to 5 Years)	
	Zero-Order	Partial	Zero-Order	Partial
1. Mother (continued)				
Acceptance	.03	.24*	.22*	.41***
Rejection	.05	-.42***	.10	-.13
Sum Score	-.27	.38***	-.09	.25*
2. Father[d]				
Encouragement of independence	-.07	.14	.07	.07
Overprotection	.19	.16	-.26*	-.26*
Sum Score	-.16	-.01	.20	.21
Acceptance	-.02	.25*	.19	.23*
Rejection	.01	-.32**	-.12	-.15
Sum Score	-.02	.29**	.17	.21
3. Peers[b]				
Acceptance	.10	.30**	-.01	.03
Rejection	-.05	-.28*	-.06	-.11
Sum Score	.08	.30**	.03	.07

[a] N = 37 for all entries.

[b] Partial correlation controls for defensiveness, measured on SOSE.

[c] Partial controls for mother idealization, measured on Mother-Father-Peer Scale.

[d] Partial controls for father idealization, measured on Mother-Father-Peer Scale.

All tests of significance are two-tailed:
* $p < .10$
** $p < .05$
*** $p < .10$

father) acted as suppressor variables. With the relevant distortions partialled out, maternal self-esteem, competence, self-control, morality, body functioning and identity were significantly correlated with the security of the child's attachment to the mother at one year of age. The dimension acceptance-rejection from both mother and father was significantly related to attachment class and, less powerfully, to the child's emotions rating at 4 or 5 years of age. The data suggest that mother's perception of acceptance in childhood is particularly strongly related to mother's behavior in the next generation.

Contributions of Attachment History and Environmental Support

The third and exploratory hypothesis of this study was that both attachment history in infancy and concurrent maternal behavior contributed to the maintenance of individual differences. Although this hypothesis has been stated as a rule of continuity in the presence of environmental support (e.g., Arend, Gove and Sroufe, 1979), it should also predict discontinuity when environmental support is, itself, discontinuous or established where it was lacking. Two approaches to assessing the relative roles of attachment security and environmental support in maintaining outcomes were taken. Each, for different reasons, should be viewed as exploratory. First a series of

multiple regressions was developed. Second, individual cases of extreme discontinuities were examined.

To establish convergent validity for major contructs (e.g., child competence, maternal support) at least two measures of each construct in different settings, had been planned (e.g. laboratory measures of maternal behavior and take-home questionnaires on maternal personality; laboratory and teacher assessents of children's self-esteem). However, since three major measures were invalidated by either selective attrition (teacher's Q-sorts), by sex and age contamination (Pictorial Scale of Perceived Competence for Young Children) or by defensiveness on self-report measures (SOSE and Mother-Father-Peer scale) one set of child outcome measures, the Emotions Scale, and one set of concurrent measures of maternal support, the ratings of maternal behavior, remained. Since these measures each reflected behavior in the laboratory, analyses would be expected to underestimate the contribution of earlier attachment classification at one year to child outcome.

Because of this, the PPVT receptive vocabulary score was also used as outcome in separate multiple regression analyses. In each case, attachment class and maternal behavior were entered as predictors. There were, as would be expected, moderate indications of colinearity

TABLE 7

ZERO-ORDER CORRELATIONS AMONG LABORATORY-BASED MEASURES

	1.	2.	3.	4.	5.	6.	7.	8.
1. Attachment class	--	ns	.31[b]	.38[c]	.25[a]	.29[a]	ns	ns
2. Emotion rating		--	.44[c]	.41[c]	.35[b]	.35[b]	-.29[b]	ns
3. Maternal behavior			--	.46[c]	ns	.29[a]	ns	ns
4. PPVT score				--	.43[c]	.55[c]	ns	ns
5. Banta - No. objects manipulated					--	ns	ns	-.32[b]
6. Referential communication successes (mother sender)						--	ns	ns
7. Negative life stress scale							--	ns
8. SES								--

Note: a. $p < .10$ (two tailed)
b. $p < .05$
c. $p < .01$
ns = not significant

(significant intercorrelations among predictor variables). Such inter-relatedness of predictives renders estimates of the independent contribution of predictors weak.

Given the limitations described, to find any contribution of attachment class is conceptually important. The relative import of attachment class and concurrent maternal support cannot, however, be accurately gauged.

Results of these analyses are shown in Table 8. Attachment class contributed little or nothing to prediction of emotions rating, while concurrent maternal behavior was a significant predictor of emotions ratings, and, in consort with perceived negative life stress, accounted for 22% of the variance in the emotions rating. Prediction to the PPVT score was dramatically different. Attachment class was a significant predictor alone, that is, when entered first into the regression analysis. It remained significant when concurrent maternal behavior was partialled out, that is, entered first into the equation. The addition of concurrent maternal behavior did, however, afford a substantial increment in overall prediction to the PPVT score. Perceived negative life stress was deleted from this equation because of its negligible contribution to prediction of the PPVT score.

The second approach taken to assessing the rela-

TABLE 8

CONTRIBUTIONS OF ATTACHMENT HISTORY, CONCURRENT MATERNAL BEHAVIOR AND FAMILY STRESS TO CHILDRENS' AFFECT AND COGNITIVE COMPETENCE

Variable	Simple r	Multiple R	R^2	beta	F ratio
EMOTION RATING (N = 44)					
1. Attachment class[a]	.19[c]	—	.037	.07	1.62
2. Maternal behavior[c]	.44*	.44**	.19	.37	4.92
3. Perceived negative life stress	-.29*	.47*	.22	-.17	1.2
PPVT IQ SCORE (N = 44)					
1. Attachment class	.38*	—	.14	.24	7.1
2. Maternal behavior	.46*	.52**	.27	.37	7.6

Note:

a. Attachment class was coded as Anxious, Intermediate, or Secure
b. Sum of "Pleasure" and "Support" ratings during referential communication task
c. As emphasized in the text, this analysis distorts the data in the direction of underestimating the contribution of attachment history.

* $p < .05$ (two tailed)
** $p < .01$

tive roles of attachment history and environmental support was to look at cases of extreme discontinuity. Children were divided into quartiles on the basis of their emotions rating. Clear change in status would be represented by an infant seen as anxious in relation to the mother at one year of being in the top quartile (high positive affect) at 4 or 5 years, and, conversely, by an infant seen as secure in relation to the mother being in the bottom quartile (low positive affect) at 4 or 5 years. Table 9 shows the distribution of emotions rating quartiles by attachment class at one year. [An overall index of association demonstrates significant continuity, as would be expected (Pearson's $r = .29$, $p < .05$). However, the increment in prediction to emotions rating afforded by knowledge of attachment class (above base rate prediction) is modest (eta = .34), as was reflected in the results using multiple regression.] There were 5 cases of clear discontinuity. Three anxiously attached infants were rated high on the emotions scale (indicating much positive, and little negative, affect) and 2 securely attached infants were rated low on the emotions scale at 4 or 5 years. Examination of the files suggested that discontinuities in environmental support played a clearly definable role in four of the five cases. In two of the cases whose change was positive, mothers who had been una-

TABLE 9

CONTINUITY AND DISCONTINUITY: PREDICTION FROM INFANT ATTACHMENT TO PRESCHOOL AFFECT

Attachment Class at One Year	Emotion Rating at 4 or 5 years			
	Quartile 1 (Low)	Quartile 2	Quartile 3	Quartile 4 (High)
Anxious	5	4	2	3
Intermediate	4	2	3	1
Secure	2	5	6	7

vailable, psychologically or physically, (due in one case to pain, in one to full-time work), became available to the children soon after the Strange Situation assessment. Both cases of change from secure to high negative affect appeared to be related to debilitating stresses. In one case, the boy had developed extremely strong defensive reactions to strangers after he had developed a sensory deficit. In the second case, one of the parents had developed a drug dependency. These interpretations are necessarily speculative, but illustrate a clear degree of change in adaptation when family circumstances change.

C H A P T E R I V

DISCUSSION

Continuity of individual adaptation

First, this study provided a partial replication of previous studies showing continuity of individual differences in adaptation from infancy to the preschool years. As such, it also tightens the nomological net supporting the construct validity of the Ainsworth Strange Situation classification of infant attachment to the caretaker (cf. Cronbach and Meehl, 1955, Joffee and Vaughn, 1982). Children who, as infants, had secure attachments to the mother presented a more affectively positive, curious and engaging approach to their world than did children who had had anxious attachments to the mother in infancy.

Extensions of previous work included the finding of a significant relationship between quality of attachment at one year and the PPVT score of preschoolers. This finding may in part be due to the higher cooperativeness in testing of children classified as securely attached in infancy. It is also complicated by the fact that the PPVT relies on receptive vocabulary to assess intelligence.

Thus we do not know whether the relationship between individual differences in security of attachment and the later intelligence score is due to the effect of individual differences in maternal behavior on intelligence or on language development, or whether the infant's or child's early-developing cognitive/linguistic abilities exerts itself on both an attachment classification and on later functioning. While the first interpretation, that maternal behavior (e.g., sensitivity and responsivity) influences security of attachment and cognitive and linguistic ability, is more consistent with the work on attachment of Bowlby (1969, 1979, 1982), Ainsworth (Ainsworth et al., 1978), Sroufe (1979a, b) and others, this question can only be answered through further empirical investigation.

Maternal support for continuity

Second, it is clear that continuity resides not only in the child, but also in continuity of environmental support. Both maternal behavior in interaction and infant attachment classification were found clearly and consistently related to individual differences in competence at four and five years. Behavioral measures indicated that mothers of preschoolers who had been classified securely attached in infancy were more supportive, showed more pleasure in interaction, and were less likely to

blame their child for failures in a communicative task and were less likely to either under or overcontrol their child's behavior than were mothers of preschoolers classified as anxiously attached at one year of age. On personality and life history measures, mothers of anxious infants were more defensive, and were more likely to idealize their own mothers (the children's grandmother) and fathers than were mothers of securely attached infants, when their infants reached four and five years of age. When defensiveness and idealization were partialled out of these scales, clear relationships between mothers' recollection of childhood relationships, mothers' self-concept, and childrens' outcomes emerged.

Discontinuity

At the same time as they clearly demonstrate continuity, the results of this study encourage a view of the child as continually adapting to environmental demands, as, perhaps, more resilient than has been suggested by earlier work.

As a rule in longitudinal research, continuity of individual differences is stronger (more predictable) for those who are doing well than for those who are doing poorly. This study included a few striking cases of discontinuity. For example, the child with the highest

emotions rating, a little girl who scored high on all other measures of preschool competence, had been classified as anxious-avoidant as a one-year-old. There had been dramatic changes in her family between the Strange Situation assessment and the follow-up. Her mother, warm, responsive and relaxed when her daughter was five, spontaneously volunteered that, in looking back, she had been intolerant and unable to enjoy her daughter in her first year of life. Future research may profitably focus on such cases of discontinuity.

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A P P E N D I X A

TABLE 10

INTER-ITEM CORRELATIONS OF THREE POSITIVE EMOTIONS RATED AT THREE POINTS IN LABORATORY VISIT

	1	2	3	4	5	6	7	8
1. Introduction: Calm, secure, emotionally stable								
2. Introduction: Happy, joyous, enthusiastic	.75							
3. Introduction Warm-hearted, affectionate, loving	.47	.66						
4. Referential communication: Calm	.69	.58	.37					
5. Referential communication: Happy	.44	.60	.67	.56				
6. Referential communication: Warm-hearted	.32	.38	.51	.49	.69			
7. General: Calm	.74	.60	.40	.73	.52	.49		
8. General: Happy	.55	.62	.55	.56	.82	.55	.69	
9. General: Warm-hearted	.37	.47	.53	.30	.56	.68	.48	.67

TABLE 11

INTER-ITEM CORRELATIONS OF FOUR NEGATIVE EMOTIONS RATED AT THREE POINTS IN LABORATORY VISIT

	1	2	3	4	5	6	7	8	9	10	11	12
1. Introduction: Sad, blue, unhappy												
2. Introduction: Frightened, anxious, nervous	.71											
3. Introduction: Tense, on-edge, agitated	.46	.57										
4. Introduction: Angry, mad, annoyed	.43	.51	.84									
5. Referential communication: Sad, blue, unhappy	.69	.51	.45	.34								
6. Referential communication: Frightened, anxious, nervous	.40	.58	.42	.26	.62							

TABLE 11 (Continued)

	1	2	3	4	5	6	7	8	9	10	11	12
7. Referential communication: Tense, on-edge, agitated	.36	.33	.78	.65	.54	.49						
8. Referential communication: Angry, mad, annoyed	.36	.27	.74	.66	.58	.44	.83					
9. General: Sad, blue, unhappy	.66	.59	.51	.42	.71	.49	.45	.40				
10. General: Frightened, anxious, nervous	.63	.70	.65	.46	.74	.63	.57	.47	.83			
11. General: Tense, on-edge, agitated	.36	.32	.82	.62	.52	.40	.76	.82	.45	.58		
12. General: Angry, mad, annoyed	.44	.35	.83	.79	.51	.26	.74	.81	.48	.50	.88	

A P P E N D I X B

Analysis of Individual Emotions

There were a number of marginally significant differences between the three attachment groups on individual emotions rated. Probability levels for these contrasts were all less than .10. Children who had secure or intermediate attachments in infancy tended to be less tense on introduction to the laboratory than children who had anxious attachments. On the general rating, children who had secure attachments in infancy were marginally more calm, more happy, more warmhearted, and less angry, sad, and tense than children who had intermediate or anxious attachments in infancy.

Analysis of the effect of period of rating on the composite emotions rating showed that children became significantly more positive over the course of the laboratory visit ($F\ 2, 78 = 8.42$, $p < .001$). Separate analyses of each emotion suggested that this was due to their being rated as calmer, less sad, less frightened and less tense (all $ps < .05$) but not happier, more warmhearted or less angry.